



**IN THE SUPERIOR COURT OF THE STATE OF WASHINGTON
IN AND FOR THE COUNTY OF KING**

***ATM SHAFIQUL KHALID, an individual and on behalf of similarly situated, Xencare
Software, Inc. v. MICROSOFT CORPORATION, a Washington Corporation, One
Redmond Way, Redmond, Washington***

No. 19-2-02755-0 SEA

**EXPERT REPORT OF SCOTT W. CRAGUN
March 15, 2024**

ASSIGNMENT

1. I have been retained as an expert by ATM Shafiquel Khalid on behalf of Xencare Software Inc. ("Khalid"). I have been asked to analyze and provide my independent opinions and testimony regarding Khalid's potential damages resulting from Microsoft Corporation's ("Microsoft") alleged violation of the Washington Consumer Protection Act, breach of contract, and breach of implied covenant of good faith and fair dealing.¹ For purposes of this report, I have been asked to assume that Microsoft committed the alleged wrongful acts.

CREDENTIALS AND COMPENSATION

2. I am a Director with Echelon Analytics LLC ("Echelon"), a financial consulting firm that provides corporate, individual, and law firm clients with financial analyses of intellectual property in dispute and non-dispute settings. I have consulted with a variety of companies regarding damages issues in litigation as well as various non-litigation financial issues. I have consulted with numerous publicly traded and closely held companies in a variety of industries including agriculture, computers, consumer products, electronics, healthcare, oil and gas, semiconductors, software, and telecommunications. I have provided valuation, financial, economic, and accounting consulting services, including economic valuation of intellectual property such as patents, trademarks, and trade secrets, to counsel and client companies. These services have included analysis of sales, costs, profits, license agreements, markets, and other related financial information. Attached as Exhibit 1 to this report is my curriculum vitae, a list of presentations and articles that I have authored, and a list of cases in which I have testified. Echelon is being compensated for its involvement in this matter

¹ First Amended Complaint for Damages for CPA, Breach of Contract, Class Action, April 22, 2019 (In the Superior Court of the State of Washington in and for the County of King, No. 19-2-02755-0 SEA) ("Khalid Amended Complaint"); Opinion, *Khalid v. Microsoft Corp.*, 2020 U.S.P.Q.2D (BNA) 11196 (Court of Appeals of Washington, October 12, 2020) ("Court of Appeals Decision").

based upon hourly billing rates. Echelon's compensation is not contingent upon the outcome of this litigation.

INFORMATION REVIEWED

3. In connection with the preparation of this report, I reviewed information made available to me by Khalid and Khalid's counsel Lowe Graham Jones PLLC. I had discussions with Khalid and W. Anthony Mason, a technical expert retained by Khalid. Additional pertinent information may be produced in this case. Accordingly, I may review this additional information and modify or supplement this report as necessary. The discussion below is based on my review of the information available as of the date of this report.

BACKGROUND

Khalid

4. Khalid is an expert in computer software, operating systems, cloud computing, and virtualization, and is an inventor.² Khalid is the founder and majority owner of Xencare Software, Inc. ("Xencare").³ Khalid "published 14 research papers in journals and conference proceedings and has been named inventor in 20 patents issued by the United States Patent and Trademark Office (USPTO)."⁴ Khalid worked as a software engineer for either Microsoft or its vendors since 1998.⁵ Khalid was employed by Microsoft from 1998 through 2006 and then again from 2012 through February 2015.⁶

² Court of Appeals Decision, ¶ 2 (the Court assumed the truth of Khalid's factual allegations set forth in Khalid's complaint, documents Microsoft submitted with its motion, and a declaration Khalid submitted in opposition to Microsoft's motion).

³ Khalid Amended Complaint, pg. 8.

⁴ Court of Appeals Decision, ¶ 2.

⁵ Court of Appeals Decision, ¶ 2.

⁶ Khalid Amended Complaint, pg. 5.

Microsoft Corporation

5. Microsoft, located in Washington, was founded in 1975.⁷ Microsoft is a technology company that develops and supports “software, services, devices, and solutions that deliver new value for customers and help people and businesses realize their full potential.”⁸ Microsoft offers “an array of services, including cloud-based solutions that provide customers with software, services, platforms, and content” and provides “solution support and consulting services.”⁹ Microsoft’s products include: “operating systems, cross-device productivity and collaboration applications, server applications, business solution applications, desktop and server management tools, software development tools, and video games.”¹⁰ Microsoft also designs, manufactures, and sells devices including: “PCs, tablets, gaming and entertainment consoles, other intelligent devices, and related accessories.”¹¹ Microsoft markets and distributes its “products and services through the following channels: OEMs, direct, and distributors and resellers.”¹²
6. Microsoft designed its gaming platform “to provide a variety of entertainment through a unique combination of content, community, and cloud services.”¹³ With respect to the “Xbox ecosystem,” Microsoft stated:

The gamer remains at the heart of the Xbox ecosystem. We are identifying new opportunities to attract gamers across a variety of different end points through our first- and third-party content and business diversification across subscriptions, ads, and digital stores. We’ve seen new devices from third-party manufacturers along with key PC and mobile end points that help us empower gamers to play in a way

⁷ Microsoft Corporation Form 10-K for the fiscal year ended June 30, 2023 (<https://microsoft.gcs-web.com/node/31736/html>) (“Microsoft 2023 10-K”), pgs. 1, 4.

⁸ Microsoft 2023 10-K, pg. 4.

⁹ Microsoft 2023 10-K, pg. 4.

¹⁰ Microsoft 2023 10-K, pg. 4.

¹¹ Microsoft 2023 10-K, pg. 4.

¹² Microsoft 2023 10-K, pg. 18.

¹³ Microsoft 2023 10-K, pg. 15.

that is most convenient to them. We are focused on growing the platform and expanding to new ecosystems to engage as many gamers as possible.

Xbox enables people to connect and share online gaming experiences that are accessible on Xbox consoles, Windows-enabled devices, and other devices. Xbox is designed to benefit users by providing access to a network of certified applications and services and to benefit our developer and partner ecosystems by providing access to a large customer base. Xbox revenue is mainly affected by subscriptions and sales of first- and third-party content, as well as advertising. Growth of our Gaming business is determined by the overall active user base through Xbox enabled content, availability of games, providing exclusive game content that gamers seek, the computational power and reliability of the devices used to access our content and services, and the ability to create new experiences through first-party content creators.¹⁴

Microsoft has 23 game development studios focused on delivering great games for console, PC, and mobile devices.¹⁵ Microsoft has developed and published some of the “biggest game franchises in history: Age of Empires, Forza, Gears of War, Halo, Minecraft, Fallout, Microsoft Solitaire, Microsoft Flight Simulator, DOOM, The Elder Scrolls, and many more.”¹⁶

7. From fiscal year 2015 through fiscal year 2023, Microsoft’s annual revenue increased from \$93.6 billion to \$211.9 billion.¹⁷ Microsoft reports its revenue across three segments: “Productivity and Business Processes,” “Intelligent Cloud,” and “More Personal Computing.”¹⁸ According to Microsoft, “Our More Personal Computing segment consists of products and services that put customers at the center of the experience with our technology.”¹⁹ “More Personal Computing” is sub-divided into four categories: “Windows,”

¹⁴ Microsoft 2023 10-K, pg. 15.

¹⁵ <https://www.xbox.com/en-US/xbox-game-studios>.

¹⁶ <https://www.xbox.com/en-US/xbox-game-studios>.

¹⁷ Microsoft 2023 10-K, pg. 44; Microsoft Corporation Form 10-K for the fiscal year ended June 30, 2017 (<https://microsoft.gcs-web.com/node/24736/html>), pg. 31.

¹⁸ Microsoft 2023 10-K, pg. 45.

¹⁹ Microsoft 2023 10-K, pg. 14.

“Devices,” “Gaming,” and “Search and news advertising.”²⁰ “Gaming” includes “Xbox hardware and Xbox content and services, comprising first- and third-party content (including games and in-game content), Xbox Game Pass and other subscriptions, Xbox Cloud Gaming, advertising, third-party disc royalties, and other cloud services.”²¹

8. From fiscal year 2016 through fiscal year 2023, Microsoft’s annual revenue from More Personal Computing increased from \$40.4 billion to \$54.7 billion (Exhibit 11). Over the same time period, Microsoft’s operating income from More Personal Computing increased from \$6.2 billion to \$16.5 billion, representing an increase in its operating income margin from 15.4% to 30.1% (Exhibit 11). From fiscal year 2016 through fiscal year 2023, Microsoft’s annual revenue from Gaming increased from \$9.2 billion to \$15.5 billion, totaling \$98.6 billion over the time period (Exhibit 12).

Wrongful Acts

9. In December 2011, Microsoft offered Khalid a position as a Senior Program Manager and, as part of the hiring process, a Microsoft recruiter asked Khalid to sign a Microsoft Corporation Employee Agreement (“Microsoft Employee Agreement”).²² On December 19, 2011, Khalid signed the Microsoft Employee Agreement and, per a section regarding “Excluded and Licensed Inventions,” Khalid provided a list of inventions made prior to his employment with Microsoft that he wanted to have excluded from the employee agreement.²³ On January 9, 2012, Khalid attended a Microsoft employee orientation program where he signed a hard copy of the Microsoft Employee Agreement and again submitted the

²⁰ Microsoft 2023 10-K, pg. 14.

²¹ Microsoft 2023 10-K, pg. 14.

²² Court of Appeals Decision, ¶ 4; Xencare022324-022329.

²³ Court of Appeals Decision, ¶¶ 4-5; Xencare022341-022344.

invention exclusion list.²⁴ Khalid received no further instruction from Microsoft regarding his invention exclusion list and worked at Microsoft from January 2012 until February 2015.²⁵

10. After being terminated by Microsoft in February 2015, Khalid sent an email to Microsoft alleging that Microsoft was using his patented technology: United States Patent No. 8,286,219 (“the ‘219 Patent”); and United States Patent No. 8,782,637 (“the ‘637 Patent”).²⁶ On February 19, 2015, a Microsoft attorney responded and stated Khalid was obligated to assign his patented technology to Microsoft under the Microsoft Employee Agreement because he did not provide an invention exclusion list when he signed the employee agreement.²⁷ Khalid informed the Microsoft attorney that he submitted an invention exclusion list at the time he entered the Microsoft Employee Agreement.²⁸ Two weeks later, the attorney responded and asserted that Microsoft held assignment rights to the ‘219 Patent and the ‘637 Patent and provided Khalid with a form to sign to assign the patents to Microsoft.²⁹ In March 2015, Khalid provided to the Microsoft attorney the invention exclusion list he attached with his Microsoft Employee Agreement.³⁰ In June 2015, Khalid notified the attorney that Microsoft’s Xbox One game console infringed the ‘637 Patent.³¹ Khalid and the Microsoft attorney discussed possible resolutions of the dispute but did not reach an agreement.³²

²⁴ Court of Appeals Decision, ¶ 6.

²⁵ Court of Appeals Decision, ¶ 6.

²⁶ Court of Appeals Decision, ¶¶ 3, 7.

²⁷ Court of Appeals Decision, ¶ 7.

²⁸ Court of Appeals Decision, ¶ 7; Xencare022341-022344.

²⁹ Court of Appeals Decision, ¶ 7.

³⁰ Court of Appeals Decision, ¶ 7.

³¹ Court of Appeals Decision, ¶ 7.

³² Court of Appeals Decision, ¶ 7.

11. In May 2016, Khalid received a letter from Microsoft's outside counsel that asserted Microsoft had no evidence that Khalid submitted an invention exclusion list, and that his "failure to exclude the inventions described in the '219 and '637 patents resulted in a grant of an exclusive, royalty-free, irrevocable, worldwide license to these inventions to Microsoft."³³ The letter from Microsoft's outside counsel proposed a settlement: "in return for a grant of a non-exclusive, royalty-free, perpetual, irrevocable, worldwide license to the disputed patents and a full release of all claims and liability, Microsoft would transfer all of its ownership interest in the '219 and '637 Patents to Khalid," which Khalid declined.³⁴ When Khalid received the letter from Microsoft's counsel, he was involved in a lawsuit with his employer prior to Microsoft, Citrix Systems, Inc. ("Citrix"), a Microsoft vendor.³⁵ Citrix claimed assignment rights to the '219 Patent and the '637 Patent, and Khalid filed a lawsuit against Citrix in October 2015, which resulted in Khalid being awarded \$5.8 million in damages.³⁶
12. In January 2019, Khalid filed this lawsuit against Microsoft.³⁷ Khalid asserted that he is the rightful owner of the '219 Patent and the '637 Patent; that he developed the technology related to those patents prior to joining Microsoft in 2012; and that he specifically notified Microsoft that his patented technology should be excluded under the Microsoft Employee Agreement.³⁸ Khalid further asserted that Microsoft's clouding of the title to the '219 Patent and the '637 Patent has prevented him from attracting investors in the technology and

³³ Court of Appeals Decision, ¶ 8; Xencare015085-015088.

³⁴ Court of Appeals Decision, ¶ 8; Xencare015085-015088.

³⁵ Court of Appeals Decision, ¶ 9.

³⁶ Court of Appeals Decision, ¶ 9.

³⁷ Court of Appeals Decision, ¶ 10.

³⁸ Court of Appeals Decision, ¶ 10; Khalid Amended Complaint, pgs. 4-8.

inhibited his ability to file additional patent applications related to those patent families.³⁹

Khalid asserted that he his company Xencare “suffered damages caused and proximately caused by the actions” of Microsoft.⁴⁰

Patents

13. The ‘219 Patent, titled “SAFE AND SECURE PROGRAM EXECUTION FRAMEWORK,” was filed on February 16, 2008 and issued on October 9, 2012.⁴¹ The ‘219 Patent was initially assigned to Xencare, which subsequently assigned rights to the patent to Khalid.⁴² The named inventors of the ‘219 Patent are Khalid, Mustafizur Rahman, and Mahruma Khatoon Siddiqua.⁴³ The “ABSTRACT” of the ‘219 Patent describes the invention as:

A system and method is provided that makes sure the instruction sets executing on a computer are certified and secure. The system and method further facilitates a generic way to intercept the instruction loading process to inspect a loaded code segment first, before the computer gets a chance to execute the code segment. Further, a profiling component can monitor all executing processes running in a system and profile the behavior of the program. If the behavior is suspicious, established by a set of predefined rules, the profiler can take necessary actions to notify a system administrator and suspend or terminate execution of the program.⁴⁴

14. Regarding the background of the invention of the ‘219 Patent:

This invention began in 2005, while Khalid was working with friends and a partner to protect computer systems from viruses and spyware. Khalid initially applied for the patent in 2005, allowed that patent application to lapse, but then reapplied for patent protection in February 2008, after months of efforts to commercialize the subject matter. Khalid began a startup company to market the invention.⁴⁵

15. The ‘637 Patent, titled “MINI-CLOUD SYSTEM FOR ENABLING USER SUBSCRIPTION TO CLOUD SERVICE IN RESIDENTIAL ENVIRONMENT,” was filed on November 22, 2010

³⁹ Khalid Amended Complaint, pgs. 9-12.

⁴⁰ Khalid Amended Complaint, pg. 21.

⁴¹ The ‘219 Patent.

⁴² The ‘219 Patent; Xencare029823; Xencare029836-029837.

⁴³ The ‘219 Patent.

⁴⁴ The ‘219 Patent.

⁴⁵ Court of Appeals Decision, ¶ 3.

and issued on July 15, 2014.⁴⁶ The '637 Patent was initially assigned to Xencare, which subsequently assigned rights to the patent to Khalid.⁴⁷ The named inventor of the '637 Patent is ATM Shafiquel Khalid.⁴⁸ The "ABSTRACT" of the '637 Patent described the invention as:

A mini-cloud system has been described to enable subscription or service model for computing infrastructure, software, and digital content. The mini-cloud system works as a pipeline for information delivery connecting end user, infrastructure provider, content provider, and retailer offering automatic provisioning of infrastructure, content life cycle management, automatic upgrade, servicing, and license managements based on subscription model. Mini-cloud system uses a subscription management component and virtualization host to back computing environment, then adds routing component to connect to back-end cloud infrastructure along with a digital content delivery framework. The system allows a user to subscribe in a computing environment, preferred software applications, and digital content like move and pay a monthly utility bill.⁴⁹

16. Regarding the background of the invention of the '637 Patent:

. . . Khalid calls [the patent] a "mini-cloud" invention. The '637 Patent is based on ideas Khalid first developed while in graduate school in 1996 and 1997. The ideas evolved to form cloud computing for residential users using a mini-cloud host and "thin terminals." The invention comprises several components: (a) a thin terminal, akin to a Roku stick, that can be inserted into any monitor and (b) connection with a subscription provider in the cloud and (c) connection to a mini-cloud host device to deliver computing resources using specific integration techniques outlined in the patent.⁵⁰

17. Khalid received another United States patent, a continuation of the '637 Patent, related to his mini-cloud system invention.⁵¹ United States Patent No. 10,849,118 ("the '118 Patent"), titled "MINI-CLOSED SYSTEM WITH EMULATOR FOR ENABLING USER SUBSCRIPTION TO

⁴⁶ The '637 Patent.

⁴⁷ The '637 Patent; Xencare029823; Xencare029836-029837.

⁴⁸ The '637 Patent.

⁴⁹ The '637 Patent.

⁵⁰ Court of Appeals Decision, ¶3.

⁵¹ The '118 Patent.

CLOUD SERVICE,” was filed on December 27, 2016 and issued on November 24, 2020.⁵²

The ‘118 Patent is assigned to Khalid.⁵³ The named inventors of the ‘118 Patent are ATM Shafiqul Khalid and Mahruma Khatoon Siddiqua.⁵⁴ The “ABSTRACT” of the ‘118 Patent described the invention as:

A mini-cloud system has been described to enable subscription or service model for computing infrastructure, software, and digital content. The mini-cloud system works as a pipeline for information delivery connecting end user, infrastructure provider, content provider, and retailer offering automatic provisioning of infrastructure, content life cycle management, automatic upgrade, servicing, and license managements based on subscription model. Mini-cloud system uses a subscription management component and virtualization host to back computing environment, then adds routing component to connect to back-end cloud infrastructure along with a digital content delivery framework. The system allows a user to subscribe in a computing environment, preferred software applications, and digital content like movie and pay like a monthly utility bill.⁵⁵

18. Mr. Mason reviewed the ‘219 Patent, the ‘637 Patent, and the ‘118 Patent (collectively, “Khalid Patents”) and considered how these patents “apply to: (1) game console emulation, such as is sometimes used to allow older console games to play on newer consoles, and (2) cloud gaming.”⁵⁶ He described the patented techniques as “tied to a general concept known as *virtualization*.”⁵⁷ Mr. Mason opined the Khalid Patents “were forward-looking relative to the state of the actual hardware capabilities at the time the patents were filed.”⁵⁸ Regarding the benefits of the technologies covered by the Khalid Patents, Mr. Mason opined:

As the industry has progressed, earlier alternatives to hardware virtualization have largely disappeared due to their complexity and technological limitations.

⁵² The ‘118 Patent.

⁵³ The ‘118 Patent.

⁵⁴ The ‘118 Patent.

⁵⁵ The ‘118 Patent.

⁵⁶ W. Anthony Mason Letter to Mark Walters, March 15, 2024 (“Mason Letter”), pg. 2.

⁵⁷ Mason Letter, pg. 2; Discussions with Anthony Mason.

⁵⁸ Masson Letter, pg. 4; Discussions with Anthony Mason.

The primary benefit of virtualization in data centers, which is directly applicable to cloud gaming, is that it provides highly flexible scaling of services. Increased demand can often be satisfied simply by creating a new “virtual machine.” This flexibility has led to the rise of large service providers including Amazon, Microsoft, IBM, and Google. These companies constantly look for new ways to increase the flexibility and support of their service centers. For example, to support an Xbox 360 emulator inside an Azure data center does not require installing any Xbox hardware – it merely requires creating a virtual machine that provides the capabilities of the Xbox hardware. The graphics elements are then compressed and sent to a client device.

There are significant benefits to this approach: dynamic flexibility in scaling services to satisfy instant demand, the use of a combination of commodity and customized hardware, and the ability to introduce optimizations that are simply impossible if the game console is inside an end-user’s entertainment room.⁵⁹

DAMAGES ANALYSIS

19. I understand the following legal principles govern remedies for the violation of the

Washington Consumer Protection Act, breach of contract, and breach of implied covenant of good faith and fair dealing. For these claims, remedies may include claims for restitution and/or for damages under reliance and compensatory damages theories, depending on the nature of harm suffered by the non-breaching party and benefits unjustly gained by the breaching party as well as on numerous other facts and circumstances surrounding the breach. Compensatory damages include two categories: expectation damages and consequential damages. Expectation damages put the non-breaching party in the position they would have been in had the contract been fully executed. Consequential damages are those that incur as a consequence of the breaching party. Another remedy may include awarding as damages the unjust enrichment obtained by the party that committed the wrongful acts.

⁵⁹ Mason Letter, pg. 4; Discussions with Anthony Mason.

20. Considering the economic harm suffered by Khalid as a result of Microsoft's wrongful acts, and based on my review of the information provided and publicly available information, I quantified Khalid's potential damages for lost royalties, lost enterprise value, lost compensation, and Microsoft's unjust enrichment.

Lost Royalties

21. Based on the information he reviewed and his expertise, Mr. Mason concluded:

- The patents appear to be technically sound.
- The patents appear to read onto the common implementation models for console emulation in both end-user console devices ("backwards compatibility" for old game support) and for enabling end user devices to play games that are emulated in the cloud, with an end-user device interacting with the cloud service via the internet.
- I am not aware of any alternatives to the virtual machine model that we use today to implement this type of functionality.
- The claims of the '637 and '118 patents describe techniques that are consistent with publicly available information from Microsoft. Without using these technologies, Microsoft would need to explore alternatives that are less efficient and more expensive.
- The clouding of the title of these patents materially impairs the ability to assert them, which means that the owner has lost substantial value.
- The value of these patents moving forward, as part of the increased growth of cloud gaming, means that the techniques taught by these patents have significant potential to grow in value. A \$90 billion market is a truly lucrative one for licensing critical technology such as these patents represent. Thus, I would expect the patent owner to license these patents on reasonable terms to Amazon, Microsoft, Sony, Nvidia, and other companies participating in both console and cloud gaming businesses, which seem to be converging.⁶⁰

22. After considering the Khalid Patents, and the potential use of these patents by third parties, Mr. Mason "identified four companies that appear to be using virtualization-based solutions consistent with the claims of the patents."⁶¹ Mr. Mason identified Microsoft as one of the companies potentially using the Khalid Patents and opined:

⁶⁰ Mason Letter, pgs. 6-7; Discussions with Anthony Mason.

⁶¹ Mason Letter, pg. 4; Discussions with Anthony Mason.

[Microsoft's] original Xbox console was based on Intel CPU, while their second-generation console, Xbox 360 used a PowerPC based CPU architecture, which was not compatible with their previous Intel CPU architecture. In addition, their GPU architecture changed from an Nvidia processor to an ATI (now AMD) processor. Thus, to run legacy games, Microsoft had to create an efficient mechanism for emulating the previous game console, both in terms of its CPU and GPU. This is most easily accomplished using virtualization techniques. Other techniques would have been more expensive and less performance . . . In addition, Microsoft's foray into cloud gaming is based upon normal center service models which include providing both specialized hardware and software via virtual machines. Microsoft is increasingly depending upon cloud gaming services to extend their market share, with industry expectations that Microsoft will announce support for cloud gaming on Sony consoles; this is in keeping with the concessions they made as part of their recent Activision/Blizzard acquisition.⁶²

23. Microsoft's wrongful acts began in February 2015, when a Microsoft attorney asserted

Khalid was obligated to assign his patented technology to Microsoft under the Microsoft Employee Agreement claiming Khalid did not provide an invention exclusion list.⁶³ As a result of Microsoft's claim of rights to the '219 Patent and the '637 Patent, the ownership in the patents became clouded, resulting in Khalid being unable to license the patents. For the period from February 2015 through December 2018, before Khalid filed this lawsuit against Microsoft, Khalid lost the opportunity to license his patents. Based on Mr. Mason's opinion regarding Microsoft's Xbox 360 game console's potential use of Khalid's patented technology, Khalid's potential damages include lost royalties from Microsoft.

24. Since 2001, Microsoft has competed in the game console business with the launch of its original Xbox.⁶⁴ In November 2005, Microsoft released Xbox 360 as its second game console.⁶⁵ Launched in November 2013, the Xbox One was promoted as the ultimate

⁶² Masson Letter, pg. 5; Discussions with Anthony Mason; Mr. Mason acknowledged that he has not reviewed the Xbox 360 software and hardware to confirm that they use virtualization (Mason Letter, pg. 5).

⁶³ Court of Appeals Decision, ¶ 7.

⁶⁴ <https://www.gamespot.com/gallery/the-evolution-of-xbox-consoles/2900-1322/>.

⁶⁵ <https://www.gamespot.com/gallery/the-evolution-of-xbox-consoles/2900-1322/>.

entertainment system.⁶⁶ Other variants of the Xbox One include at least the Xbox One S and the Xbox One X.⁶⁷ The most recent iterations of the Xbox, the Xbox Series S and Xbox Series X released in November 2020.⁶⁸

25. Based on data from VGChartz, a business intelligence and research firm, from February 19, 2015 through December 31, 2018, Microsoft sold 17.9 million Xbox One game consoles in the United States (Exhibit 3).⁶⁹ After the introduction of Xbox 360, Microsoft's Xbox game consoles have been sold at a price between \$299 and \$499.⁷⁰ Based on the lowest price of \$299, which game console allegedly includes Khalid's patented technology, Microsoft's estimated Xbox One United States revenue from February 19, 2015 through December 31, 2018 totaled \$5.4 billion (Exhibit 3).

26. To determine the royalty rate to apply to calculate Khalid's lost royalties, I considered generally accepted valuation methods: the Market Approach, the Income Approach, and the Cost Approach.⁷¹ Based on the information available in this case and publicly available information, I have relied on the Market Approach to estimate the royalty rate for rights to the Khalid Patents. The Market Approach "is often used as the primary valuation approach

⁶⁶ <https://www.gamespot.com/gallery/the-evolution-of-xbox-consoles/2900-1322/>.

⁶⁷ <https://www.gamespot.com/gallery/the-evolution-of-xbox-consoles/2900-1322/>;
<https://www.xbox.com/en-US/xbox-one?xr=shellnav>.

⁶⁸ <https://www.gamespot.com/articles/everything-you-need-to-know-about-xbox-series-x/1100-6466640/>.

⁶⁹ <https://www.vgchartz.com/about.php>; https://www.vgchartz.com/tools/hw_date.php?reg=USA&ending=Yearly.

⁷⁰ <https://www.ign.com/articles/comparing-the-price-of-every-game-console-with-inflation>;
<https://www.tweaktown.com/news/75025/look-back-at-historic-video-game-console-prices-from-1977-2020/index.html>.

⁷¹ https://viewpoint.pwc.com/dt/us/en/pwc/accounting_guides/fair_value_measureme/fair_value_measureme__9_US/chapter_4_concepts_u_US/44_valuation_approac_US.html#pwc-topic.dita_1513084709184630; the Georgia-Pacific Factors generally used in patent infringement cases to determine a reasonable royalty, which include both qualitative and quantitative considerations, take into account the generally accepted valuation methods such as the Market Approach, the Income Approach, and the Cost Approach (*Georgia-Pacific Corp. v. United States Plywood Corp.*, 318 F. Supp. 1116 (S.D.N.Y. 1970)).

for financial assets” and “uses prices and other relevant information generated by market transactions involving identical or comparable (that is, similar) assets.”⁷²

27. Exhibit 7 provides a table summarizing researched publicly available information regarding royalty rates agreed to by parties for rights to software and/or technologies, including patented technologies, that appear similar to the technologies covered by the Khalid Patents or involve licensing in similar industries (cloud/network security and game development application tools). The publicly available transaction royalty rates ranged from 1% to 5% (Exhibit 7).⁷³
28. Based on the information discussed above, a royalty rate in the range of 1% to 3% is reasonable to apply to estimate Khalid’s lost royalties resulting from Microsoft’s wrongful acts. Applying the 1% to 3% royalty rate range to estimated Microsoft’s Xbox One game console United States revenue of \$5.4 billion from February 19, 2015 through December 31, 2018 results in lost royalties of \$53.6 million to \$160.8 million (Exhibit 3).
29. I understand Khalid is entitled to prejudgment interest on his lost royalties that he should have started receiving beginning in February 2015 absent Microsoft’s wrongful acts.⁷⁴ I calculated prejudgment interest through May 20, 2024, the estimated date of trial. Based on the Revised Code of Washington (RCW):

(1) Except as provided in subsection (4) of this section, any rate of interest shall be legal so long as the rate of interest does not exceed the higher of: (a) Twelve percent per annum; or (b) four percentage points above the equivalent coupon issue yield (as published by the Board of Governors of the Federal Reserve System) of the average bill rate for twenty-six week treasury bills as determined

⁷² https://viewpoint.pwc.com/dt/us/en/pwc/accounting_guides/fair_value_measureme/fair_value_measureme__9_US/chapter_4_concepts_u_US/44_valuation_approac_US.html#pwc-topic.dita_1513084709184630.

⁷³ One of the publicly available royalty rates was \$5 per unit (Exhibit 7). Based on the \$299 Xbox price, a \$5 per unit royalty rate equates to a 1.7% royalty rate.

⁷⁴ Discussions with Khalid’s counsel.

at the first bill market auction conducted during the calendar month immediately preceding the later of (i) the establishment of the interest rate by written agreement of the parties to the contract, or (ii) any adjustment in the interest rate in the case of a written agreement permitting an adjustment in the interest rate.⁷⁵

I have been asked to apply a 12% simple interest rate to calculate Khalid's prejudgment interest related to his lost royalties.⁷⁶ Applying the 12% simple interest rate to Khalid's lost royalties results in prejudgment interest from February 19, 2015 through December 31, 2018 totaling \$44.3 million to \$133.0 million (Exhibit 3). Khalid's total lost royalties and prejudgment interest total \$98.0 million to \$293.8 million (Exhibit 3).

30. To determine Khalid's potential lost royalties damages, I applied a success rate to the total royalties and prejudgment interest to account for the risk associated with Khalid successfully litigating his patent infringement claims against Microsoft. A "2018 Patent Litigation Study," conducted by PricewaterhouseCoopers, concluded that from 2013 through 2017, patent holders experienced a 52% success rate with bench trials and a 74% success rate with jury trials.⁷⁷ Non-practicing entity patent holders experienced a 36% success rate with bench trials and a 72% success rate with jury trials.⁷⁸ A January 2024 law journal article provided "an empirical review of the U.S. Court of Appeals for the Federal Circuit's decisions in patent cases during calendar year 2023."⁷⁹ For district court appeals, the article reported that patent owners and patent applicants had a 32% success rate and a

⁷⁵ <https://app.leg.wa.gov/RCW/default.aspx?cite=19.52.020>.

⁷⁶ Discussions with Khalid's counsel.

⁷⁷ 2018 Patent Litigation Study, PWC ("Patent Litigation Study"), pg. 7 (<https://www.pwc.com/us/en/forensic-services/publications/assets/2018-pwc-patent-litigation-study.pdf>).

⁷⁸ Patent Litigation Study, pg. 8.

⁷⁹ *Fed. Circ. Patent Decisions In 2023: An Empirical Review*, Law 360, January 4, 2024 ("CAFC Review") (<https://www.perkinscoie.com/images/content/2/6/268360/Fed.-Circ.-Patent-Decisions-In-2023-An-Empirical-Review.pdf>).

47% success rate including mixed results.⁸⁰ To account for the litigation risk, I applied a 30% to 50% litigation success rate to Khalid's lost royalties and prejudgment interest which results in potential Khalid Xbox lost royalties damages ranging from \$29.4 million to \$146.9 million (Exhibit 3).⁸¹

31. To the extent the Court determines that Microsoft's wrongful acts resulted in Khalid being unable to license his patents from 2019 through trial, I have provided a calculation of Khalid's potential additional Xbox lost royalties damages. Based on estimated Microsoft's Xbox One and Xbox Series X/S United States revenue from January 1, 2019 through December 31, 2023, and applying the methodology described above, Khalid's potential additional Xbox lost royalty damages total \$21.4 million to \$107.1 million (Exhibit 4).
32. In addition to Microsoft's Xbox game console, Mr. Mason identified Sony as one of the companies potentially using the Khalid Patents and opined:

[Sony's] PS3 platform was based on the cell processor, which was a descendant of the Power PC processor, it is not an Intel-compatible CPU. To make PS3 games work on subsequent platforms was most easily implemented using a virtual machine that emulated the cell processor instruction set. Other alternatives would have been more expensive and less flexible.⁸²

⁸⁰ CAFC Review, pgs. 5, 7.

⁸¹ The analysis of potential Khalid Xbox lost royalties damages does not include Microsoft Xbox revenue from sales outside of the United States (https://www.vgchartz.com/tools/hw_date.php?reg=Global&ending=Yearly) and does not include Microsoft Xbox gaming software revenue (<https://www.statista.com/statistics/200035/xbox-gaming-software-revenue-global/>). If this additional revenue is determined to infringe Khalid's mini-cloud patents, additional potential lost royalties damages would more than double.

⁸² Mason Letter, pg. 4; Mr. Mason further stated: "While it is possible Sony used a virtualization solution for PS4 to PS5 compatibility, there is insufficient public information to determine if this is, in fact, the case" (Mason Letter, pg. 4); Mr. Mason identified Amazon Luna and Nvidia GeForce Now as the two other "companies that appear to be using virtualization-based solutions consistent with the claims of [Khalid's] patents" (Mason Letter, pgs. 4-6). There is insufficient publicly available information available regarding Amazon Luna and Nvidia GeForce Now sales to estimate Khalid's potential lost royalties related to these cloud gaming services.

33. Sony is also a competitor in the gaming console business and launched its PlayStation One in the United States in September 1995.⁸³ In July 2000, Sony re-released the PlayStation One as a smaller, more compact version of the original.⁸⁴ Later that year, in October 2000, Sony released the PlayStation 2.⁸⁵ In November 2006, Sony released the PlayStation 3, offering two different models with varying amounts of memory.⁸⁶ In November 2013, Sony released the PlayStation 4.⁸⁷ Sony also released a PlayStation 4 Pro in November 2016.⁸⁸ In November 2020, Sony released the most current iteration of the PlayStation, the PlayStation 5.⁸⁹
34. Based on data from VGChartz, from February 19, 2015 through December 31, 2018, Sony sold 20.8 million PlayStation 4 game consoles in the United States (Exhibit 5).⁹⁰ After the introduction of PlayStation 3, Sony's PlayStation game consoles have been sold at a price between \$399 and \$599.⁹¹ Based on the lowest price of \$399, which game console allegedly includes Khalid's patented technology, Sony's estimated PlayStation 4 United States revenue from February 19, 2015 through December 31, 2018 totaled \$8.3 billion (Exhibit 5).

⁸³ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁴ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁵ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁶ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁷ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁸ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁸⁹ <https://www.psu.com/news/history-of-playstation-ps1-ps2-ps3-ps4-and-ps5-launch-prices-specs-and-games/>.

⁹⁰ https://www.vgchartz.com/tools/hw_date.php?reg=USA&ending=Yearly.

⁹¹ <https://www.ign.com/articles/comparing-the-price-of-every-game-console-with-inflation>;
<https://www.tweaktown.com/news/75025/look-back-at-historic-video-game-console-prices-from-1977-2020/index.html>.

35. Based on estimated Sony PlayStation 4 United States revenue from February 19, 2015 through December 31, 2018, and applying the methodology described above, including a 12% prejudgment interest rate and a 30% to 50% success rate, results in potential Khalid PlayStation lost royalties damages ranging from \$45.4 million to \$226.8 million (Exhibit 5).
36. To the extent the Court determines that Microsoft's wrongful acts resulted in Khalid being unable to license his patents from 2019 through trial, I have provided a calculation of Khalid's potential additional PlayStation lost royalties damages. Based on estimated Sony PlayStation 4 and PlayStation 5 United States sales from January 1, 2019 through December 31, 2023, and applying the methodology described above, Khalid's potential additional PlayStation lost royalty damages total \$37.9 million to \$189.4 million (Exhibit 6).

Lost Enterprise Value

37. As part of his business plan to monetize his patented inventions through a start-up company, Khalid had 30 patents in the pipeline, at least fifteen of which were filed as patent applications at some point before or during Microsoft's wrongful acts.⁹² As a result of Microsoft's wrongful acts, Khalid lost opportunities to monetize his inventions covered by the Khalid Patents.⁹³ For example, in July 2015, Khalid received a letter from the CEO of Pragma Systems, Inc. ("Pragma") regarding Khalid's "living room virtualization venture."⁹⁴

The Pragma CEO letter included:

This letter is to confirm some recent \$350K investment discussion between Pragma Systems and ATM Shafiquel Khalid on his living room virtualization start-up. The discussion failed because Khalid was having some patent dispute with Microsoft.

⁹² List of patent applications and items in the pipeline as of 2016; 62/258,529 filed on 11/22/2015; 17/102,401 filed on 11/23/2020.

⁹³ Discussions with Khalid; Khalid Amended Complaint, pgs. 9-10.

⁹⁴ Letter from Quamrul Mina to Khalid, Re: ATM Shafiquel Khalid/living room virtualization venture, July 20, 2015.

In February 2015, ATM Shafiquel Khalid called me for possible funding on Khalid's living room virtualization venture using his recently issued mini-cloud patent. I was aware of Khalid early prototyping work from 2009 when Khalid filed his patent on mini-cloud home virtualization. Since mini-cloud patent had been issued I found this opportunity appealing. I wanted to invest total \$350K using resources from Pragma Systems, Pragma Systems associates and my personal fund. I set a condition that Khalid patent title needs to be clean and claim free. I also introduced Khalid to one of my executive to explore additional funding Khalid needed to become successful. Khalid also told me that he was trying to secure additional funding using his own network.

Few weeks later Khalid notified us that Microsoft wanted to claim ownership to the mini-cloud patent title. Later Khalid told us Microsoft might relinquish claim in the patent title in exchange of royalty free access to the mini-cloud patent family. We decided not to proceed with our investment commitment.⁹⁵

38. As another example, in October 2015, a representative of Gerchen Keller Capital, LLC (“GKC”) responded to an email from Khalid and stated GKC would “be delighted to discuss your case in more detail.”⁹⁶ In December 2015, after several communications, the GKC representative sent Khalid an email that stated GKC is “going to have to pass for now . . . With the ownership battle in dispute plus some holes in the claim chart, this is too much risk for us to bear.”⁹⁷ The GKC representative further stated GKC “would be happy to reengage if the ownership of the patents becomes clear.”⁹⁸
39. Khalid’s economic harm or potential damages can be measured based on Khalid’s lost opportunity to monetize the Khalid Patents, his lost enterprise value resulting from the clouded ownership of the Khalid Patents. I estimated Khalid’s lost enterprise value damages using two methodologies.

⁹⁵ Letter from Quamrul Mina to Khalid, Re: ATM Shafiquel Khalid/living room virtualization venture, July 20, 2015.

⁹⁶ Email from Ashley C. Keller to Khalid, Subject: Patent Opportunity, October 19, 2015.

⁹⁷ Email from Ashley C. Keller to Khalid, Subject: Re: Patent Opportunity, December 18, 2015.

⁹⁸ Email from Ashley C. Keller to Khalid, Subject: Re: Patent Opportunity, December 18, 2015.

40. For the first estimate of Khalid's lost enterprise value, I considered Khalid's incurred expenses, or investment, related to the inventions covered by the Khalid Patents. Khalid prepared a "Costing estimate or replacement value of Khalid projects" in 2016 dollars, which included an analysis based on hourly costs for Seattle-area software engineers and required software engineering hours for writing, using, and modifying a few million lines of code (over 34,000 files).⁹⁹ Khalid and his start-up team invested a total of 32,250 research and development hours, which equated to an investment of \$4.3 million.¹⁰⁰
41. A November 2007 research report, prepared by professors from Willamette University and University of Washington, was titled "Returns to Angel Investors in Groups" "(Return to Investors Report)".¹⁰¹ The Returns to Investors Report provided "robust data" on angel investing returns that "has never before been available."¹⁰² The study was "based on the largest data set of accredited angel investors collected to date, with information on exits from 539 angels."¹⁰³
42. The Returns to Investors Report concluded that the "overall returns on group-affiliated angel investments average to a 2.6X return on investment after 3.5 years."¹⁰⁴ Investments that had a return of 10X to 30X had average holding times of 4.9 years.¹⁰⁵ The Returns to Investors Report concluded "returns varied with the amount of time an investor held an investment . . . typically, the length of time investors held their investments increased with

⁹⁹ Xencare015613.

¹⁰⁰ Xencare015613.

¹⁰¹ *Returns to Angel Investors in Groups*, Robert Wiltbank, Ph.D., Willamette University, Warren Boeker, Ph.D., University of Washington, November 2007 ("Returns to Investors Report") (https://www.angelcapitalassociation.org/data/Documents/Resources/AngelGroupResearch/1d%20-%20Resources%20-%20Research/6%20RSCH_-_ACEF_-_Returns_to_Angel_Investor_in_Groups.pdf).

¹⁰² Returns to Investors Report, pg. 1.

¹⁰³ Returns to Investors Report, pg. 1.

¹⁰⁴ Returns to Investors Report, pg. 3.

¹⁰⁵ Returns to Investors Report, pg. 3.

each level of positive return.”¹⁰⁶ The Returns to Investors Report also concluded “early-stage investments significantly improved [the investors’] prospects of overall positive multiples.”¹⁰⁷

43. To determine Khalid’s estimated lost enterprise value, a 10X return on investment is reasonable to apply to Khalid’s investment in the Khalid Patents. Applying a 10X return on investment is based on: the Returns to Investors Report conclusions; the length of investment time (approximately nine years from February 2015 through May 2024); the investment would be an early-stage investment at start-up; and Mr. Mason’s opinions that alternatives to the “critical technology” covered by the Khalid Patents are less efficient and more expensive and, with the increased growth of cloud gaming, the Khalid Patents “have significant potential to grow in value [in] a \$90 billion market.”¹⁰⁸
44. Applying a 10X return on investment to Khalid’s \$4.3 million investment results in an estimated enterprise value of \$43.0 million (Exhibit 8). To determine Khalid’s potential lost enterprise value damages, the lost enterprise value should be offset to account for the remaining term of the patents, assuming Khalid prevails and receives rights to the Khalid Patents in May 2024, and the damages awarded to Khalid in his lawsuit with Citrix. Applying 45% to the lost enterprise value, the length of the patent term Khalid lost due to Microsoft’s wrongful acts (approximately nine years out of a twenty-year patent life), and deducting \$3 million, the amount awarded to Khalid related to lost enterprise value in the

¹⁰⁶ Returns to Investors Report, pg. 4.

¹⁰⁷ Returns to Investors Report, pg. 4.

¹⁰⁸ Returns to Investors Report, pgs. 3-4; Mason Letter, pg. 7.

Citrix litigation, results in potential Khalid lost enterprise value damages of \$16.4 million (Exhibit 8).¹⁰⁹

45. For the second estimate of Khalid's lost enterprise value, I considered Microsoft's research and development investment per patent. A January 2016 article on Microsoft's website, titled "Our growing patent portfolio," reported Microsoft Technology Licensing, LLC, "a subsidiary of Microsoft formed to manage the company's patent assets," received 5,422 United States and International patents in 2015.¹¹⁰ The Microsoft article further reported "Microsoft invests more than \$11.4 billion in research and development on a worldwide basis."¹¹¹ Based on this article, Microsoft invested an average of \$2.1 million per issued patent in 2015 (Exhibit 8). Applying this \$2.1 million per patent to Khalid's three patents results in a research and development investment value of \$6.3 million (Exhibit 8).

46. Using \$6.3 million as the incurred expenses or investment value of the Khalid Patents, I applied the same methodology as the first estimate. Applying a 10X return of investment and offsetting for the remaining patent life and Citrix damages awards, results in potential Khalid lost enterprise value damages of \$25.4 million (Exhibit 8).

Lost Compensation

47. As a result of Microsoft's wrongful acts, Khalid was denied the opportunity to receive compensation for serving as the Chief Technology Officer ("CTO") of a start-up company.¹¹² Khalid's economic harm includes potential lost compensation damages.

¹⁰⁹ Special Verdict Form, *ATM Shafiqul Khalid v. Citrix Systems, Inc.*, Superior Court of the State of Washington, Case No. 15-2-24309-8, August 1, 2018, pg. 2; Discussions with Khalid.

¹¹⁰ <https://blogs.microsoft.com/on-the-issues/2016/01/15/our-growing-patent-portfolio/>.

¹¹¹ <https://blogs.microsoft.com/on-the-issues/2016/01/15/our-growing-patent-portfolio/>.

¹¹² Discussions with Khalid.

48. Without the opportunity to work as the CTO of start-up company related to the Khalid Patents as a result of Microsoft's wrongful acts, Khalid's annual compensation from 2015 forward has been approximately \$200,000 to \$300,000.¹¹³ Khalid believes his annual compensation as a CTO at a start-up company would range from \$800,000 to \$1.2 million.¹¹⁴ For example, a partner level software engineer at Microsoft received reported annual compensation of \$785,000, and a senior principle software engineer at Amazon received reported annual compensation of \$915,000.¹¹⁵ As another example, a "Portfolio CTO" job listing for what appears to be Trilogy, a company that provides end-to-end solutions for software businesses, offered annual compensation of \$800,000.¹¹⁶
49. Estimating it would take five years at the start-up company to reach an annual compensation of \$800,000, and based on lost annual compensation of \$500,000 (\$800,000 less \$300,000), Khalid's lost compensation from February 2015 through May 20, 2024 totals \$3.2 million (Exhibit 9). Applying 12% prejudgment interest to the lost compensation results in potential Khalid lost compensation damages of \$4.3 million (Exhibit 9). To the extent the Court determines that Microsoft's wrongful acts impacted Khalid's annual compensation after trial, potential Khalid future lost compensation damages from June 2024 through December 2033 total \$3.7 million (Exhibit 9).

Microsoft Unjust Enrichment

50. Microsoft was potentially unjustly enriched by improperly claiming ownership of the Khalid Patents. Microsoft's potential unjust enrichment can be measured by the return it

¹¹³ Discussions with Khalid.

¹¹⁴ Discussions with Khalid.

¹¹⁵ <https://www.levels.fyi/companies/microsoft/salaries/software-engineer/levels/partner>; <https://www.levels.fyi/companies/amazon/salaries/software-engineer?country=254>.

¹¹⁶ <https://www.crossover.com/jobs/3686/trilogy/portfolio-cto>; <https://trilogy.com>.

received from the research and development costs it avoided by improperly claiming ownership of the Khalid Patents. Microsoft's fiscal year 2015 worldwide revenue totaled \$93.6 billion (Exhibit 10). Microsoft's fiscal year 2015 worldwide research and development expenses totaled \$12.0 billion (Exhibit 10). Therefore, in fiscal year 2015, for each \$1 of research and development expense, Microsoft received \$7.77 in revenue (Exhibit 10).

51. Applying this \$7.77 revenue per \$1 research and development expense to Khalid's estimated investment of \$4.3 million in the Khalid Patents, and the investment value of \$6.3 million for the Khalid Patents based on Microsoft's research and development expense per patent, results in potential Microsoft unjust enrichment of \$33.4 million to \$49.0 million (Exhibit 10).

OTHER ANALYSIS

52. This letter represents my analysis, opinions, and conclusions at this time and is based on information available to me as of the date of this report. The citations listed in this report are illustrative, and as part of my analysis, I have also considered the additional documents and information I have reviewed. I understand that discovery in this case is ongoing; therefore, I may be asked to review certain additional information, documents, and/or testimony produced subsequent to the issuance of this report.
53. If additional relevant information or testimony becomes available to me, or the legal issues in this case are narrowed, I reserve the opportunity to revise or supplement my analysis, opinions, and conclusions. I may also testify at trial regarding any related matter raised by either party if asked to do so by the Court or the parties' attorneys. In connection with my anticipated trial testimony in this action, I may use as exhibits various documents produced in this litigation, which refer or relate to the matters discussed in this report. In addition, I may create or assist in the creation of certain demonstrative exhibits to assist me in

providing testimony. I have not yet selected or created such exhibits. This report is intended solely for use in the above-referenced litigation and is not to be used for any other purpose.

March 15, 2024



Scott W. Cragun